



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,680	08/31/2001	Robert Dayton Sigler	18180.0187	9302
20350	7590	02/25/2004	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			FINEMAN, LEE A	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/942,680	SIGLER ET AL.	
	Examiner	Art Unit	
	Lee Fineman	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-17, 27-29, 33-35, 37-49, 51-62 and 64-66 is/are pending in the application.
- 4a) Of the above claim(s) 12-17, 27-29 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 34-35, 37-40, 42-43, 47-49, 51-56, 61-62, 64-66 is/are rejected.
- 7) ☒ Claim(s) 41, 44-46 and 57-60 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 December 2003 has been entered in which claims 34, 47, 49, 51, 54 and 61 were amended and claims 36, 50 and 63 were cancelled. Claims 12-17, 27-29, 33-35, 37-49, 51-62 and 64-66 are pending of which 12-17, 27-29 and 33 are withdrawn.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 47 and 54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 47 and 54 have the limitation "at about 50 millimeters or closer" which is vague and indefinite. It is unclear what the scope of closer than about 50 millimeters is.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2872

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 49, 51-54, 56, 61 and 64-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Duncan et al., U.S. Patent No. 5,905,591.

Regarding claims 49, 51-54 and 56, Duncan et al. disclose a distributed aperture optical system (figs. 4-6) comprising a plurality of collector telescopes (22), each having an intermediate image plane (at 42) at which intermediate images are formed; and a plurality of phase plates (48 or 50) corresponding to the plurality of collector telescopes, each phase plate, which is a phase corrector (column 3, lines 33-40, in so far at least some of the sine magnification errors are corrected) and which has substantially no optical power (inherent in a flat mirror) is disposed approximately at or near the image plane of a corresponding collector telescope (fig. 5) and has a surface adapted to adjust phase relationships of the images (column 6, lines 40-49) wherein the phase relationships include sine magnification errors (in so far as sine magnification errors are inherent in the distributed aperture system and adjusting the phase plates, or mirrors, reduces some of the sine magnification errors). Duncan et al. meets the limitations of claim 54, in as much as the claim is able to be understood in light 35 U.S.C 112 rejection made above.

Regarding claims 61 and 64-66, Duncan et al. disclose a method of adjusting a phase relationship in a distributed aperture optical system wherein distortion is associated with sine magnification error (column 6, lines 40-49, in so far as sine magnification errors are inherent in the distributed aperture system and adjusting the phase plates, or mirrors, reduces some of the

Art Unit: 2872

sine magnification errors and is therefore associated with sine magnification error) as shown in figs. 4-6 comprising receiving electromagnetic radiation (38) from one or more sources at a first mirror device (32); receiving a portion of the of the electromagnetic radiation reflected from the first mirror device at a second mirror device (34); transmitting a portion of the electromagnetic radiation reflected from the second mirror device through a phase plate (48 or 50) that is configured to approximately phase the electromagnetic radiation transmitted through the phase plate to reduce distortion in a resulting image (column 6, lines 40-49), which is a phase error corrector; receiving a portion of the electromagnetic radiation transmitted through the phase plate at a third mirror device (52); and wherein the phase plate is approximately non-optically powered (the phase plate is planar, fig. 1).

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 34-35, 37-40, 42-43, 47, 55 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan et al. in view of Korsch, U.S. Patent No. 4,101,195.

Regarding claims 34-35, 37, 39-40, 42-43 and 47, Duncan et al. disclose a distributed-aperture telescope (figs. 4-6) having a distributed aperture, the distributed-aperture telescope comprising a plurality of subaperture telescopes (22) positioned within the distributed

Art Unit: 2872

aperture, wherein each telescope includes a primary mirror device (32), the primary mirror device being configured to receive electromagnetic radiation (38) from one or more sources; a secondary mirror device (34) coupled to the primary mirror device, the secondary mirror device being configured to redirect a portion of the electromagnetic radiation reflected from the primary mirror device (fig. 5); a tertiary mirror device (44) coupled to the secondary mirror device, the tertiary mirror device being configured to redirect a portion of the electromagnetic radiation from reflected the secondary mirror device; an intermediate image plane (at 42) disposed between the secondary mirror device and the tertiary mirror device; and a phase plate (48), which has substantially no optical power (inherent in a flat mirror), disposed within a vicinity of the intermediate image plane, wherein the phase plate is configured to adjust a phase relationship associated with a sine magnification error of the portion of the electromagnetic radiation associated with a resulting image (column 6, lines 40-49, , in so far as sine magnification errors are inherent in the distributed aperture system and adjusting the phase plates, or mirrors, reduces some of the sine magnification errors and is therefore associated with sine magnification error) and is a phase-error corrector configured to reduce distortion of the resulting image (column 3, lines 33-40); wherein the primary mirror device is disposed between the second mirror device and the tertiary mirror device (fig. 5); wherein each primary mirror device has a central aperture (40) formed therein; and a portion of the electromagnetic radiation reflected from the secondary mirror devices passes through the central apertures formed in the primary mirror devices (fig. 5); and wherein the intermediate image planes are disposed between the primary mirror devices and the tertiary mirror devices (fig. 5). Duncan et al. disclose the claimed invention except for each subaperture telescope being a three-mirror anastigmat (TMA). Korsch teaches an anastigmatic

Art Unit: 2872

three-mirror telescope in fig. 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the subaperture telescopes of Duncan et al. with three-mirror anastigmatic telescopes as suggested by Korsch to provide high resolution over a wide field of view with more efficient baffling to reduce stray light (column 3, lines 40-43, Korsch). Duncan et al. in view of Korsch meets the limitations of claim 47, in as much as the claim is able to be understood in light 35 U.S.C 112 rejection made above.

Regarding claims 38 and 55, Duncan et al. in view of Korsch disclose the claimed invention except for the phase plates being a refractive or diffractive element. Official Notice is taken the refractive or diffractive elements are well known equivalents for reflective elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the equivalent optical elements, including refractive or diffractive elements as claimed, to provide the appropriate phase adjustments to the system.

Regarding claim 62, Duncan et al. disclose the claimed invention except for receiving a portion of the electromagnetic radiation reflected from the tertiary mirror at a fold flat mirror having an aperture formed therein. Korsch teaches in fig. 2 a method of receiving a portion of the electromagnetic radiation reflected from the first mirror device (10) at a second mirror device (16) to a tertiary mirror (20) and receiving a portion of the electromagnetic radiation reflected from the tertiary mirror at a fold flat mirror (40) having an aperture (42) formed therein. It would have been obvious to one of ordinary skill in the art at the time the invention was made to insert a fold flat mirror having an aperture formed therein in the system of Duncan et al. to provide more efficient baffling to reduce stray light (column 3, lines 40-43, Korsch).

Art Unit: 2872

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan et al. in view of Korsch as applied to claim 34 above, and further in view of LAMA Project Overview, [www.astro.ubc.ca/lmt/lama/documents](http://www.astro.ubc.ca/lmt/lama/documents) [online] (henceforth LAMA).

Duncan et al. in view of Korsch disclose the claimed invention but are silent to the size of the distributed aperture. LAMA teaches distributed aperture telescopes with large distributed apertures including 42 meters (pages 3 and 44). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the distributed aperture of Duncan et al. in view of Korsch about 44.6 meters as suggested by LAMA to provide higher resolution for further astronomical exploration.

#### ***Allowable Subject Matter***

9. Claims 41, 44-46 and 57-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Claims 41 and 57 have allowable subject matter over the prior art for the reasons stated in the office action mailed 27 June 2003.

Claims 44-46 and 58-60 have allowable subject matter over the prior art for at least the reason that the prior art fails to teach and/or suggest “wherein each phase plate is a refractive element having a flat surface and a corrector surface” or as set forth in the claimed combination.



Art Unit: 2872

Duncan et al. or the combination of Duncan et al. and Korsch disclose a distributed-aperture telescope (figs. 4-6, Duncan) including phase plates (48 or 50) to correct/adjust phase relationships including sine magnification error (column 6, lines 40-49) but the phase plates are not a refractive element having a flat surface and a corrector surface as claimed.

### *Response to Arguments*

11. Applicant's arguments, see page 12, line 17 to page 13, line 13, filed 19 December 2003, with respect to claims 44-46 and 58-60 and the Braunecker and Cook references have been fully considered and are persuasive. The rejection of claims 44-46 and 58-60 has been withdrawn.

12. Applicant's arguments filed 19 December 2003 have been fully considered but they are not persuasive.

Applicant argues that Duncan et al. uses mirrors to adjust/correct the lag (or path length difference) between the beams and does not correct a phase relationship including sine magnification error. The examiner respectfully disagrees. A distributed aperture system has sine magnification errors and adjusting the mirrors, or phase plates, reduces at least some of these sine magnification errors. The examiner points to the applicant's own disclosure, page 3, lines 18-25 where it is stated that the internal steering system of Duncan et al. mitigates some of the sine magnification errors.

Regarding the applicant's statement that the LAMA document is not prior art. The examiner would like to point out that while the web page may have been updated on 12

Art Unit: 2872

September 2002, the project overview, which is the document used, is clearly dated 11 November 1999 and is acceptable as prior art.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-23124. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
LAF

February 23, 2004

  
MARK A. ROBINSON  
PRIMARY EXAMINER